A Mission Management Application Suite for Airborne Science Operations
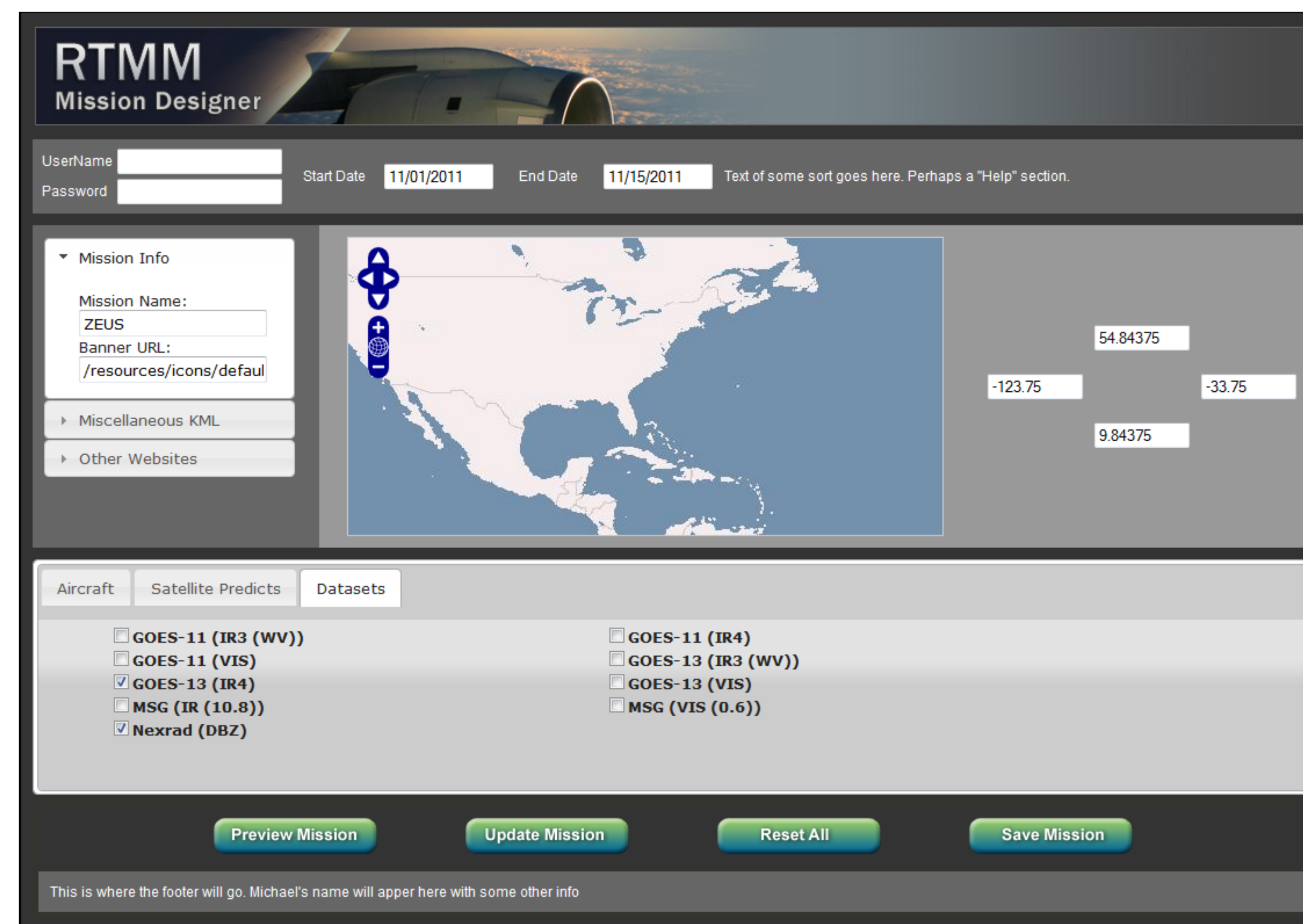
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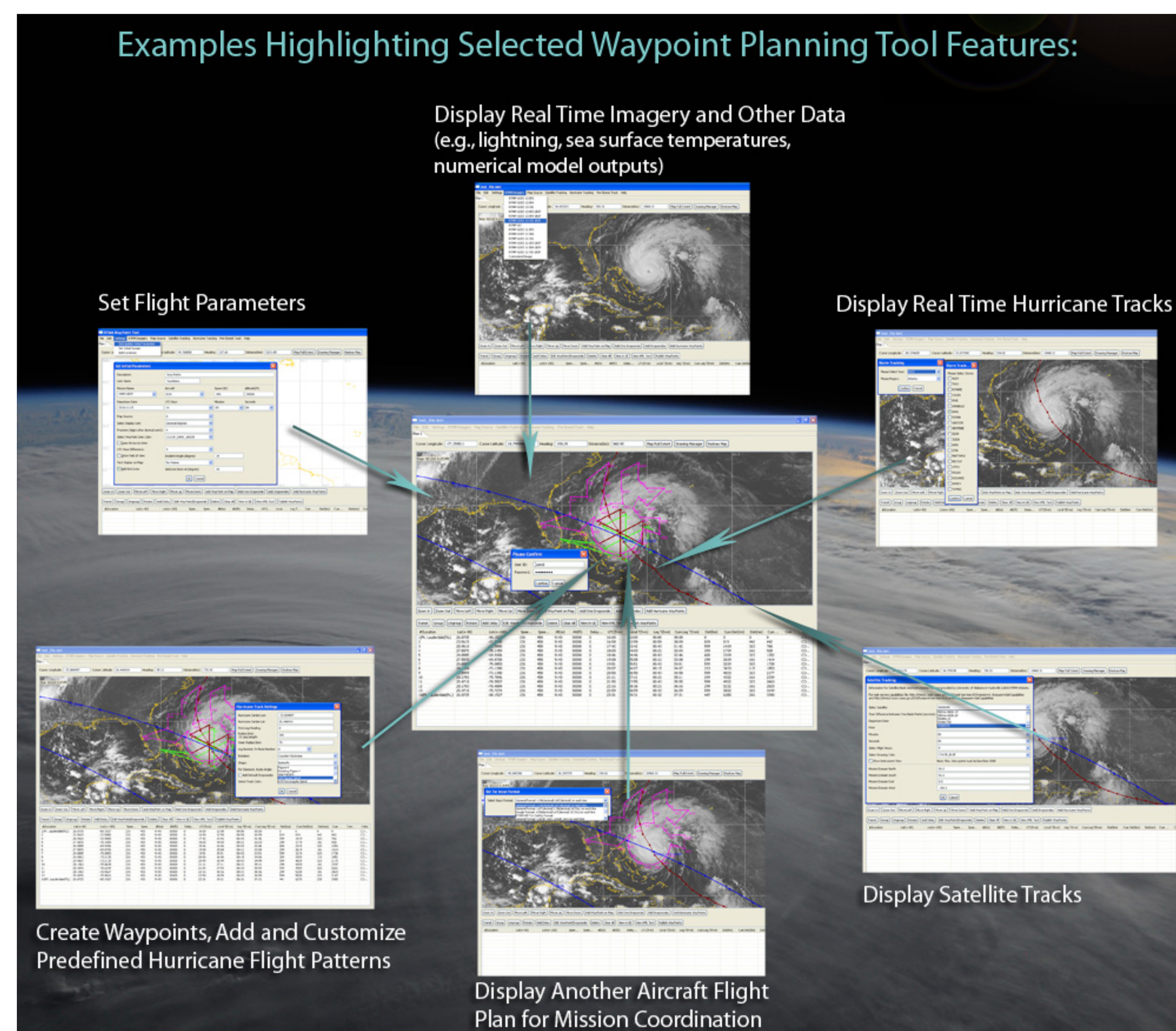[1] NASA Marshall Space Flight Center   [2] University of Alabama in Huntsville

A suite comprised of web-based tools for mission design, flight planning, aircraft visualization and tracking

Mission Design:

- Set geographic boundaries
- Set dates of campaign
- Intelligently select datasets
- Add web-based resources
- Upload mission branding

The Mission Designer provides an interface to a database of assets and environmental data sets. The mission manager chooses the spatial and temporal domains, selects sensors and data sets to be used during the mission and publishes the mission. This published mission is then viewable within the Real Time Mission Monitor (RTMM).
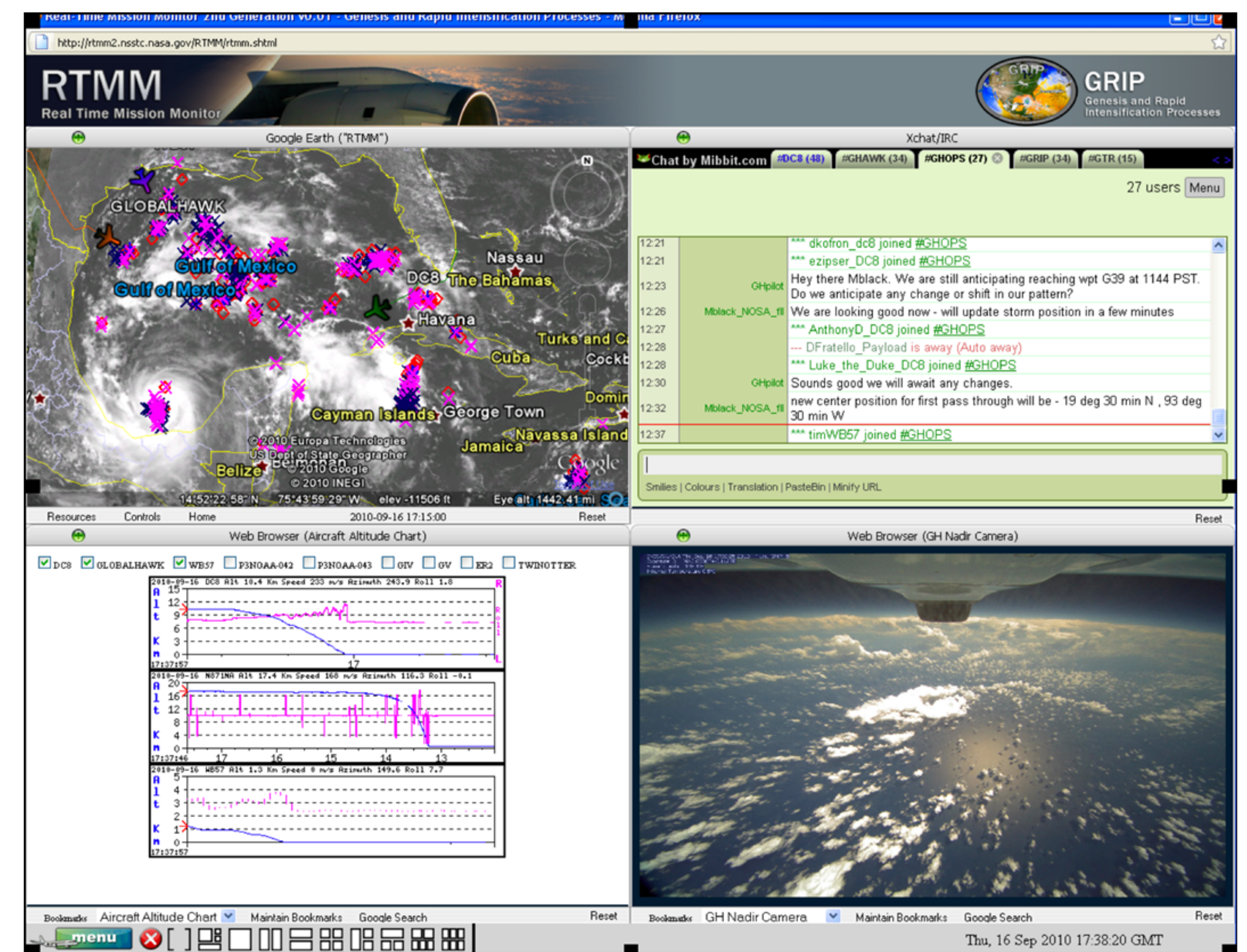
Visualization and Tracking:

- User-configurable layout and tools for an integrated display
- Provides layering of several environmental parameters
- Real-time tracking of multiple aircraft
- Scientific collaboration through multiple chat sessions
- Aids scientists in decision support

Flight (Waypoint) Planning:

- Assemble aircraft flight plans
- Plan coincident observations
- Model and remote sensing background layers
- Provides numerous pre-defined flight patterns
- Choose from multiple aircraft
- Publish plan in several formats

The Waypoint planning tool allows the scientist to plan flight tracks for the aircraft. Pre-defined flight patterns may be incorporated, and scaled or rotated to meet the mission needs. Various underlays are available. Once completed, the plan is published and vetted with the aircraft crew and is then viewable within the Real Time Mission Monitor.

The Real Time Mission Monitor has been used with numerous NASA airborne science field campaigns. The tool provides real time situational awareness, and fosters collaboration among scientists on the ground and those on the aircraft. Numerous aircraft may be tracked simultaneously. The scientist can configure the panels to one of many arrangements and can select which tool is portrayed within a panel.